

EXHIBIT 27

Material Safety Data Sheet



ARATHANE® 5750 A

1. Product and company identification

Product name : ARATHANE® 5750 A
Material uses : Component used for the manufacture of electrical insulation parts
(M)SDS # : 00052694
Validation date : 12/11/2013.
Supplier/Manufacturer : Huntsman Advanced Materials Americas LLC
P.O. Box 4980
The Woodlands, TX 77387

Non-Emergency phone: (800) 257-5547

E-Mail: MSDS@huntsman.com

In case of emergency : Chemtrec: (800) 424-9300 or (703) 527-3887

2. Hazards identification

Physical state : Liquid.
Odor : Aromatic.
Color : Yellow.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview : **WARNING!**
FLAMMABLE LIQUID AND VAPOR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. POSSIBLE DEVELOPMENTAL HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE ADVERSE DEVELOPMENTAL EFFECTS, BASED ON ANIMAL DATA.

Flammable liquid. Keep away from heat, sparks and flame. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not get on skin or clothing. Avoid contact with eyes. Avoid exposure during pregnancy. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

See toxicological information (Section 11)

GENERAL INFORMATION : Read the entire MSDS for a more thorough evaluation of the hazards.

3. Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
Diphenylmethane 4,4'-diisocyanate	101-68-8	60 - 100
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	39310-05-9	13 - 30
Toluene	108-88-3	7 - 13
Methylenediphenyldiisocyanate (mixed isomers)	26447-40-5	3 - 7
triethyl phosphate	78-40-0	1 - 3

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4. First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Notes to physician** : No specific treatment. Treat symptomatically. Call medical doctor or poison control center immediately if large quantities have been ingested.

5. Fire-fighting measures

- Flash point** : Closed cup: 31°C (87.8°F) [ASTM D 93 (Pensky-Martens Closed Cup)]
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
phosphorus oxides
- Extinguishing media**
- Suitable** : Use dry chemical, CO₂, water spray (fog) or foam.
- Not suitable** : Do not use water jet.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact

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6. Accidental release measures

information and Section 13 for waste disposal.

7. Handling and storage

Handling

: Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure during pregnancy. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage

: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

Ingredient	Exposure limits
Diphenylmethane 4,4'-diisocyanate	ACGIH TLV (United States, 3/2012). TWA: 0.005 ppm 8 hours.
	OSHA PEL (United States, 6/2010). CEIL: 0.02 ppm CEIL: 0.2 mg/m ³
Toluene	OSHA PEL Z2 (United States, 11/2006). TWA: 200 ppm 8 hours.
	CEIL: 300 ppm AMP: 500 ppm 10 minutes.
	ACGIH TLV (United States, 3/2012). TWA: 20 ppm 8 hours.

Recommended monitoring procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures

: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

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8. Exposure controls/personal protection

Hygiene measures	: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
Personal protection	
Respiratory	: In case of inadequate ventilation wear respiratory protection. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Hands	: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. > 8 hours (breakthrough time): Ethyl Vinyl Alcohol Laminatc (EVAL), butyl rubber
Eyes	: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
Skin	: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
Environmental exposure controls	: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Appearance	
Physical state	: Liquid.
Color	: Yellow.
Odor	: Aromatic.
pH	: Not available.
Boiling/condensation point	: >109°C (>228.2°F)
Melting/freezing point	: Not available.
Flash point	: Closed cup: 31°C (87.8°F) [ASTM D 93 (Pensky-Martens Closed Cup)]
Flammable limits	: Not available.
Auto-ignition temperature	: Not available.
Vapor pressure	: Not available.
Specific gravity	: Not available.
Water solubility	: Reacts with water
Partition coefficient: n-octanol/water (log Kow)	: Not available.
Viscosity	: Dynamic (room temperature): 30 mPa·s (30 cP)

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9 . Physical and chemical properties

Density : 1.2 g/cm³
 Vapor density : 8.6
 Evaporation rate (butyl acetate = 1) : Not available.

10 . Stability and reactivity

Chemical stability : The product is stable.
 Under normal conditions of storage and use, hazardous reactions will not occur.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Materials to avoid : strong acids, strong bases, strong oxidising agents

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information**Acute toxicity**

Product/ingredient name	Test	Endpoint	Species	Result
Diphenylmethane 4,4'-diisocyanate	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat - Male, Female	0.49 mg/l
	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rabbit - Male, Female	>9400 mg/kg
	OECD 401 Acute Oral Toxicity	LD50 Oral	Rat - Male	>10000 mg/kg
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat - Male, Female	0.49 mg/l
	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rabbit - Male, Female	>9400 mg/kg
	OECD 425 Acute Oral Toxicity: Up-and-Down Procedure	LD50 Oral	Rat - Female	>5000 mg/kg
Toluene	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Vapor	Rat - Male, Female	28.1 mg/l
	Unknown guidelines	LD50 Dermal	Rabbit	>5000 mg/kg
	EU EC B.1 Acute Toxicity (Oral)	LD50 Oral	Rat - Male	5580 mg/kg
Methylenediphenyldiisocyanate (mixed isomers)	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat - Male, Female	>2.24 mg/l
	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat - Male, Female	0.49 mg/m ³
	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rabbit - Male, Female	>9400 mg/kg
	No official guidelines	LD50 Oral	Rat - Male, Female	>2000 mg/kg
triethyl phosphate	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat - Male, Female	>8817 mg/m ³
	-	LD50 Dermal	Rabbit	>20000 mg/kg
	-	LD50 Oral	Rat	1600 mg/kg

Conclusion/Summary : Diphenylmethane 4,4'-diisocyanate Irritating to respiratory system.

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11 . Toxicological information

Irritation/Corrosion

Product/ingredient name	Test	Species	Result
Diphenylmethane 4,4'-diisocyanate	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Irritant
	OECD 405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Non-irritant.
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	OECD 405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Non-irritant.
	-	Rabbit	Skin - Irritant
Toluene	EU	Rabbit	Skin - Irritant
	OECD 405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Mild irritant
triethyl phosphate	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Non-irritant.
	OECD 405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Moderate irritant

Conclusion/Summary

Skin

- : Diphenylmethane 4,4'-diisocyanate Irritating to skin.
- MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE) Irritating to skin.
- Toluene Irritating to skin.
- Methylenediphenyldiisocyanate (mixed isomers) No additional information.
- triethyl phosphate Non-irritating to the skin.

Eyes

- : Diphenylmethane 4,4'-diisocyanate Based on the human occupational exposure data, this substance is considered as irritating to eyes.
- MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE) Based on the human occupational exposure data, this substance is considered as irritating to eyes.
- Toluene Non-irritating to the eyes.
- Methylenediphenyldiisocyanate (mixed isomers) No additional information.
- triethyl phosphate Irritating to eyes.

Respiratory

- : Diphenylmethane 4,4'-diisocyanate No additional information.
- MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE) No additional information.
- Toluene No additional information.
- Methylenediphenyldiisocyanate (mixed isomers) No additional information.
- triethyl phosphate No additional information.

Sensitizer

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11 . Toxicological information

Product/ingredient name	Test	Route of exposure	Species	Result
Diphenylmethane 4,4'-diisocyanate	OECD 429 Skin Sensitization: Local Lymph Node Assay	skin	Mouse	Sensitizing
	OECD 406 Skin Sensitization	skin	Guinea pig	Not sensitizing
	No official guidelines	Respiratory	Guinea pig	Sensitizing
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	OECD 406 Skin Sensitization	skin	Guinea pig	Sensitizing
	No official guidelines	Respiratory	Guinea pig	Sensitizing
Toluene	EU EC B.6 Skin Sensitisation	skin	Guinea pig	Not sensitizing
Methylenediphenyldiisocyanate (mixed isomers)	OECD 406 Skin Sensitization	skin	Guinea pig	Not sensitizing
	No official guidelines	Respiratory	Guinea pig	Sensitizing
	OECD 429 Skin Sensitization: Local Lymph Node Assay	skin	Mouse	Sensitizing
triethyl phosphate	OECD 429 Skin Sensitization: Local Lymph Node Assay	skin	Mouse	Not sensitizing

Mutagenicity

Product/ingredient name	Test	Result
Diphenylmethane 4,4'-diisocyanate	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Negative
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Negative
Toluene	Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic Metabolic activation: +/-	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Negative
Methylenediphenyldiisocyanate (mixed isomers)	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Negative
triethyl phosphate	Experiment: In vitro Subject: Bacteria Experiment: In vitro Subject: Mammalian-Animal	Negative

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	Metabolic activation: +/- Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Negative

Conclusion/ Summary : Diphenylmethane 4,4'-diisocyanate triethyl phosphate No mutagenic effect.
No mutagenic effect.

Carcinogenicity

Product/ingredient name	Test	Species	Dose	Exposure	Result/Result type
Diphenylmethane 4,4'-diisocyanate	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Male, Female	1 mg/m ³	2 years; 5 days per week	Positive - Inhalation - NOAEL
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Male, Female	1 mg/m ³	2 years; 5 days per week	Negative - Inhalation - NOAEL
Toluene	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Male, Female	4522 mg/m ³	103 weeks; 6. 5 hours per day	Negative - Inhalation - NOAEL
Methylenediphenyldiisocyanate (mixed isomers)	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Male, Female	1 mg/m ³	2 years; 5 days per week	Negative - Inhalation - NOAEL

Carcinogenic class

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Diphenylmethane 4,4'-diisocyanate	-	3	-	-	-	-
Toluene	A4	3	-	-	-	-

Reproductive toxicity

Product/ingredient name	Test	Species	Maternal toxicity	Fertility	Developmental effects
Toluene	OECD 416 Two-Generation Reproduction Toxicity Study	Rat - Male, Female	Positive	Negative	Positive
Methylenediphenyldiisocyanate (mixed isomers)	OECD 414 Prenatal Developmental Toxicity Study	Rat - Male, Female	Negative	Negative	Negative

Conclusion/ Summary :

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11. Toxicological informationDiphenylmethane 4,4'-
diisocyanate
triethyl phosphate

No known significant effects or critical hazards.

In accordance with column 2 of Annex VII - X of Regulation
(EC) No 1907/2006, the test for this property of the
substance does not need to be conducted.**Teratogenicity**

Product/ingredient name	Test	Species	Result/Result type
Diphenylmethane 4,4'- diisocyanate	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	Negative - Inhalation
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	Negative - Inhalation
Toluene	EPA CFR	Rat - Female	Negative - Inhalation
Methylenediphenyldiisocyanate (mixed isomers)	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	Negative - Inhalation
triethyl phosphate	OECD 414 Prenatal Developmental Toxicity Study	Rat	Negative - Oral

**Conclusion/
Summary**: Diphenylmethane 4,4'-
diisocyanate
triethyl phosphate

No known significant effects or critical hazards.

No known significant effects or critical hazards.

Potential acute health effects

Inhalation : Irritating to respiratory system. May cause sensitization by inhalation.
Ingestion : No known significant effects or critical hazards.
Skin contact : Irritating to skin. May cause sensitization by skin contact.
Eye contact : Irritating to eyes.

Potential chronic health effects

Product/ingredient name	Test	Endpoint	Species	Result
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Chronic NOEC Inhalation Dusts and mists	Rat - Male, Female	0.2 mg/m³
Toluene	EU	Sub-chronic NOAEL Oral	Rat - Male, Female	625 mg/kg
	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Chronic LOEC Inhalation Vapor	Rat - Male, Female	600 ppm
Methylenediphenyldiisocyanate (mixed isomers)	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Chronic NOEC Inhalation Dusts and mists	Rat - Male, Female	0.2 mg/m³
triethyl phosphate	EU	Sub-acute NOAEL Oral Sub-chronic NOEC	Rat - Male, Female Rat - Male	1000 mg/kg 366 mg/m³

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11 . Toxicological information

		Inhalation Dusts and mists		
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General : Contains material that can cause target organ damage. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Target organs : Contains material which causes damage to the following organs: upper respiratory tract. Contains material which may cause damage to the following organs: kidneys, the nervous system, liver, brain, central nervous system (CNS).

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : Contains material which may cause developmental abnormalities, based on animal data.

Fertility effects : No known significant effects or critical hazards.

Medical conditions aggravated by over-exposure

Pre-existing respiratory and skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Test	Endpoint	Exposure	Species	Result
Diphenylmethane 4,4'-diisocyanate	OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test	Acute	EC50	24 hours Static	<i>Daphnia</i> >1000 mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish >1000 mg/l
	OECD 211 <i>Daphnia Magna</i> Reproduction Test	Chronic	NOEC	21 days Semi-static	<i>Daphnia</i> >10 mg/l
	OECD 201 Alga, Growth Inhibition Test	Chronic	NOEC	72 hours Static	Algae 1640 mg/l
	OECD 201 Alga, Growth Inhibition Test	Acute	EC50	72 hours Static	Algae >1640 mg/l
	OECD 209 Activated Sludge, Respiration Inhibition Test	Acute	EC50	3 hours Static	Bacteria >100 mg/l
	OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test	Acute	EC50	24 hours Static	<i>Daphnia</i> >1000 mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish >1000 mg/l
	OECD 211 <i>Daphnia Magna</i> Reproduction Test	Chronic	NOEC	21 days Semi-static	<i>Daphnia</i> >10 mg/l
	OECD 201 Alga, Growth Inhibition Test	Chronic	NOEC	72 hours Static	Algae 1640 mg/l
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	EPA CFR	Acute	EC50	48 hours Renewal	<i>Daphnia</i> 3.78 mg/l
Toluene					

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Methylenediphenyldiisocyanate (mixed isomers)	-	Acute	LC50	96 hours Flow-through	Fish	5.5	mg/l
	Unknown guidelines	Chronic	NOEC	40 days Flow-through	Fish	1.39	mg/l
	EPA CFR	Chronic	NOEC	7 days Renewal	Daphnia	0.74	mg/l
	OECD 201 Alga, Growth Inhibition Test	Acute	EC50	72 hours Static	Algae	>1640	mg/l
	OECD 209 Activated Sludge, Respiration Inhibition Test	Acute	EC50	3 hours Static	Bacteria	>100	mg/l
	OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test	Acute	EC50	24 hours Static	Daphnia	>1000	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	>1000	mg/l
	OECD 211 <i>Daphnia Magna</i> Reproduction Test	Chronic	NOEC	21 days Semi-static	Daphnia	>10	mg/l
	OECD 201 Alga, Growth Inhibition Test	Chronic	NOEC	72 hours Static	Algae	1640	mg/l
	-	Acute	EC50	72 hours Static	Algae	901	mg/l
triethyl phosphate	EPA OPPTS	Acute	LC50	96 hours Static	Daphnia	>100	mg/l
	-	Acute	LC50	96 hours Static	Fish	>100	mg/l
	EPA OPPTS	Acute	LC50	96 hours Static	Fish	>100	mg/l
	-	Chronic	EC10	30 minutes Static	Bacteria	2985	mg/l
	OECD 211 <i>Daphnia Magna</i> Reproduction Test	Chronic	NOEC	21 days	Daphnia	31.6	mg/l
	-	-	-	-	-	-	-

Conclusion/Summary : triethyl phosphate Not toxic or harmful to aquatic organisms.

Persistence and degradability

Product/ingredient name	Test	Period	Result
Diphenylmethane 4,4'-diisocyanate	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %
Toluene	ASTM	5 days	81 %
Methylenediphenyldiisocyanate (mixed isomers)	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %
triethyl phosphate	EPA OPPTS 302B Inherent Biodegradability: Zahn-Wellens/EMPA Test	28 days	98 %
	OECD 301C Ready Biodegradability - Modified MITI Test (I)	28 days	0 %

Conclusion/Summary : Diphenylmethane 4,4'-diisocyanate Not biodegradable
triethyl phosphate Inherently biodegradable

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ARATHANE® 5750 A**12 . Ecological information**

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Diphenylmethane 4,4'-diisocyanate	Fresh water 0.83 days	-	Not readily
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	-	-	Not readily
Toluene	-	-	Readily
Methylenediphenyldiisocyanate (mixed isomers)	-	-	Not readily
triethyl phosphate	Fresh water 2007.5 days	-	Not readily

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Diphenylmethane 4,4'-diisocyanate	4.51	200	low
MDI HOMOPOLYMER (NCO>=3) (SUBSTANCE)	8.56	200	low
Toluene	2.73	-	low
Methylenediphenyldiisocyanate (mixed isomers)	4.51	439	low
triethyl phosphate	1.11	0.5 to 0.8	low

Other adverse effects : No known significant effects or critical hazards.

Other ecological information

BOD₅ : Not Determined

COD : Not Determined

TOC : Not Determined

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

14 . Transport information**Proper shipping name**

DOT : RESIN SOLUTION

TDG : RESIN SOLUTION

IMDG : RESIN SOLUTION

IATA : RESIN SOLUTION





12/11/2013.

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ARATHANE® 5750 A

14 . Transport information

Regulatory information	UN number	Classes	PG*	Label	Additional information
DOT Classification	UN1866	3	III		Reportable quantity 8234.5 lbs / 3738.5 kg [823 gal / 3115.4 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
TDG Classification	UN1866	3	III		-
IMDG Class	UN1866	3	III		Emergency schedules (EmS) F-E, _S-E_
IATA-DGR Class	UN1866	3	III		Passenger and Cargo Aircraft Quantity limitation: 60 L Packaging instructions: 355 Cargo Aircraft Only Quantity limitation: 220 L Packaging instructions: 366

PG* : Packing group

15 . Regulatory informationUnited States

HCS Classification : Flammable liquid
Irritating material
Sensitizing material
Target organ effects

U.S. Federal regulations

TSCA 8(b) inventory : **United States inventory (TSCA 8b)**: All components are listed or exempted.
TSCA 5(a)2 final significant new use rule (SNUR) : No ingredients listed.

TSCA 5(e) substance consent order : No ingredients listed.

TSCA 12(b) export notification : No ingredients listed.

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15. Regulatory information

SARA 311/312 : Fire hazard
Immediate (acute) health hazard
Delayed (chronic) health hazard

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration %</u>
Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)	Diphenylmethane 4,4'-diisocyanate toluene	101-68-8	60.72 8

Clean Air Act - Ozone Depleting Substances (ODS) : EPCRA Section 313 (40 CFR 372) CERCLA (Comprehensive Environmental Response, Compensation and Liability Act): 4,4-Methylene diphenyl diisocyanate (CAS 101-68-8) has a 5,000 lb. RQ (reportable quantity). Any spill or release above the RQ must be reported to the National Response Center (800-424-8802).

This product does not contain nor is it manufactured with ozone depleting substances.

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration %</u>
SARA 313 Form R - Reporting requirements	Diphenylmethane 4,4'-diisocyanate Toluene	101-68-8 108-88-3	60.72 7.9928

CERCLA Hazardous substances :

Components	Concentration %	Section 304 CERCLA Hazardous Substance	CERCLA Reportable Quantity (Lbs)	Product Reportable Quantity (Lbs)
Diphenylmethane 4,4'-diisocyanate	60.72	Listed	5000	8235
Toluene	7.9928	Listed	1000	12511

State regulations

PENNSYLVANIA - RTK : Diphenylmethane 4,4'-diisocyanate, toluene

California Prop 65 : **WARNING:** This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>
Toluene	No	Yes

International regulations

Canada

WHMIS (Canada) : Class B-2: Flammable liquid
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

CEPA DSL : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

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ARATHANE® 5750 A

15 . Regulatory information

International lists

: Australia inventory (AICS): All components are listed or exempted.
 China inventory (IECSC): All components are listed or exempted.
 Japan inventory: All components are listed or exempted.
 Korea inventory: All components are listed or exempted.
 Malaysia Inventory (EHS Register): Not determined.
 New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
 Philippines inventory (PICCS): All components are listed or exempted.
 Taiwan inventory (CSNN): Not determined.

16 . Other information

Label requirements

: FLAMMABLE LIQUID AND VAPOR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. POSSIBLE DEVELOPMENTAL HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE ADVERSE DEVELOPMENTAL EFFECTS, BASED ON ANIMAL DATA.

Hazardous Material

Information System (U.S.A.)

Health	2
Flammability	3
Physical hazards	1
Personal protection	

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Date of printing : 12/11/2013.
 Date of issue : 12/11/2013.
 Date of previous issue : 8/08/2008
 Version : 3

Indicates information that has changed from previously issued version.

Notice to reader

While the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS

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ARATHANE® 5750 A

16 . Other information

THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE. NO PART OF THIS DATA SHEET MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM, OR BY ANY MEANS, WITHOUT PERMISSION IN WRITING FROM HUNTSMAN. ALL REQUESTS FOR PERMISSION TO REPRODUCE MATERIAL FROM THIS DATA SHEET SHOULD BE DIRECTED TO HUNTSMAN, MANAGER, PRODUCT SAFETY AT THE ABOVE ADDRESS.

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PVA\SPCX2115\Space X add auto flush
system\

EXHIBIT 27



QUOTATION

DATE
9/19/2013

QUOTATION NUMBER
131909W3267

1 Mustang Drive Cohoes NY, 12047

Tel 518 371 2684 ext 2421

Fax 518 371 2688

JConnally@pva.net

www.pva.net

TO:
Duc Q. Phan
SpaceX
1 Rocket Road
Hawthorne, CA 90250

This fax is intended to be viewed only by the person that is addressed to. This fax is confidential in nature, and subject to copyright protection. If you are not the intended recipient or the agent of the intended or if you are unable to deliver this communication to the intended recipient, please do not read, copy, or use this communication to show it to any other person, but notify the sender immediately by telephone at (518) 371-2684.

QTY	MODEL	DESCRIPTION	Price/ ea	Extended
1	B72-01433	Rework the dispense system on machine serial number W3267 to connect one cartridge to (1) one gallon tank for automatic solvent flush of Arethane 5705. <ul style="list-style-type: none"> Includes all hoses and fittings needed for complete integration. Includes one pneumatic ball valve for automatic solvent flush. Includes hardware and software needed for integration. Includes new one gallon tank. 	\$4,175.00	\$4,175.00
1	ON-SITE	On-site from PVA to travel o Space X and install the new auto solvent flush system. <ul style="list-style-type: none"> Labor rate based on 8-10 hour work day Monday through Friday non-US holiday. 	\$1,150.00	\$1,150.00
1	Expenses	Estimate of the direct travel expenses to travel from Cohoes NY to Hawthorne CA for one full day on-site. <ul style="list-style-type: none"> Expenses to include but not limited to airfare, lodging, ground transportation and meals. Estimate can be used as a not to exceed limit. 	\$1,750.00	\$1,750.00

Total: \$7,075.00


TERMS	DELIVERY	SHIPMENT	WARRANTY
100% Net 30	6 weeks ARO	FOB PVA Factory Cohoes NY USA, + crating charge of up to \$500 (if applicable)	1 Year on all parts and labor Excluding soft seals.

ORDER CANCELLATION POLICY

Buyer may only cancel the order for equipment in writing with a cancel charge as per the following schedule:

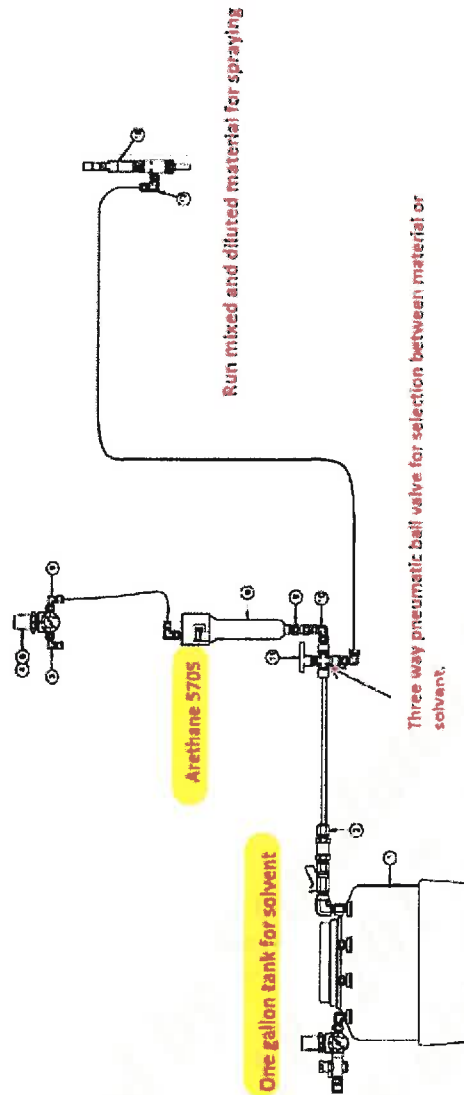
Cancellation Notice Received	Cancellation Fee Multiplier
0-30 days from order date	25%
31-60 days from order date	35%
More than 60 days from order date	70%

AUTHORIZED SIGNATURE



Jon Connelly
Technical Sales

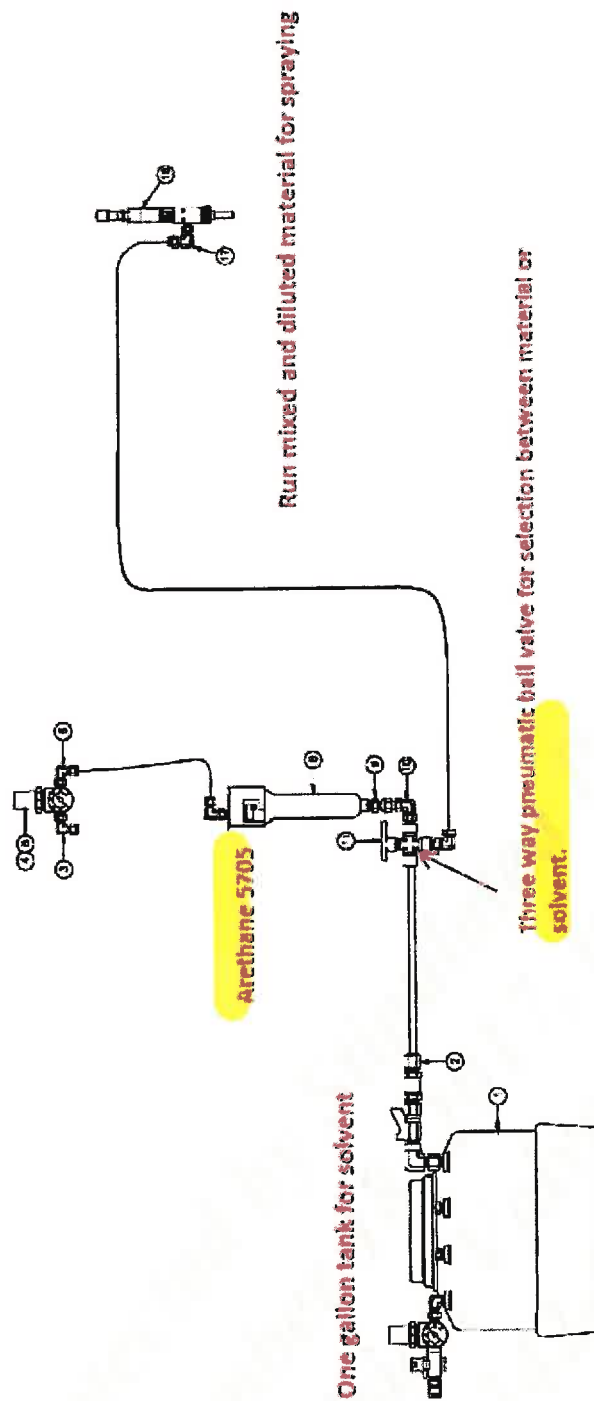
This quotation is valid for 60 days from the date of issue and does not include any applicable federal, state, or local taxes. Prices are subject to change at anytime after this quotation has expired. This quotation can only be withdrawn or modified prior to expiration date by written notice from PVA to you. No terms and conditions stated on the Purchase Order shall modify the terms or conditions contained in this proposal.

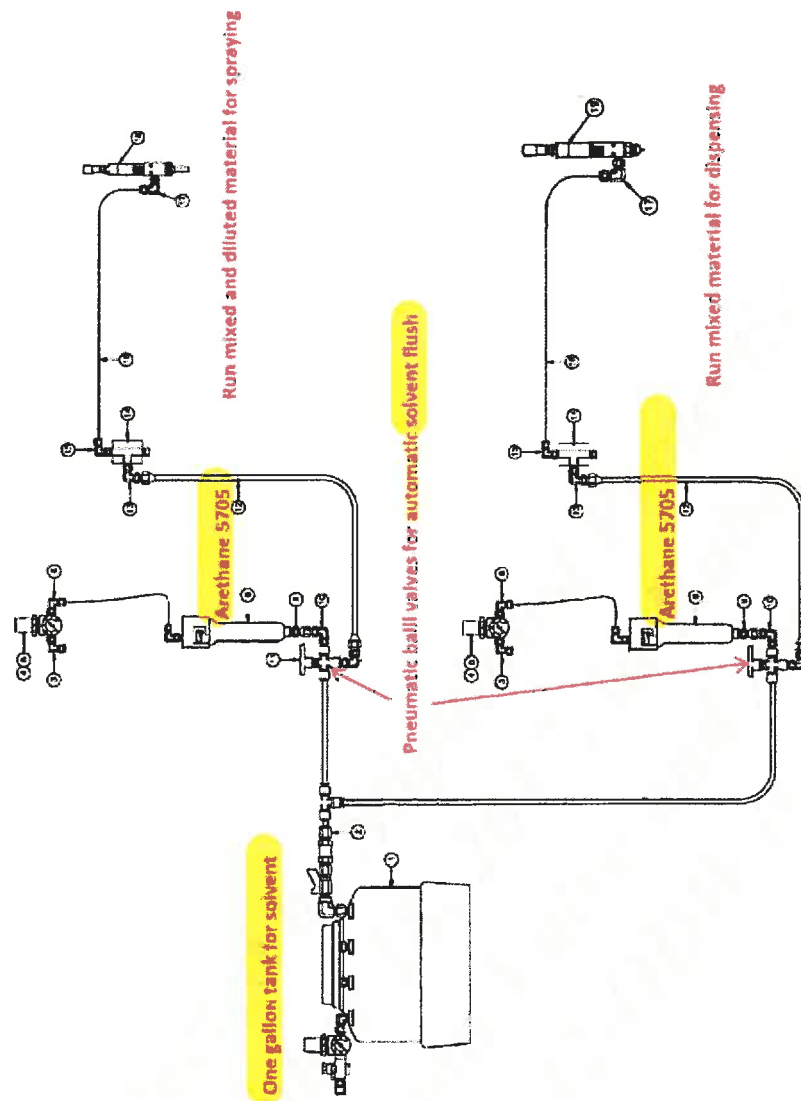


PVA\SPCX2115\Space X add auto flush system\

PVA-0343

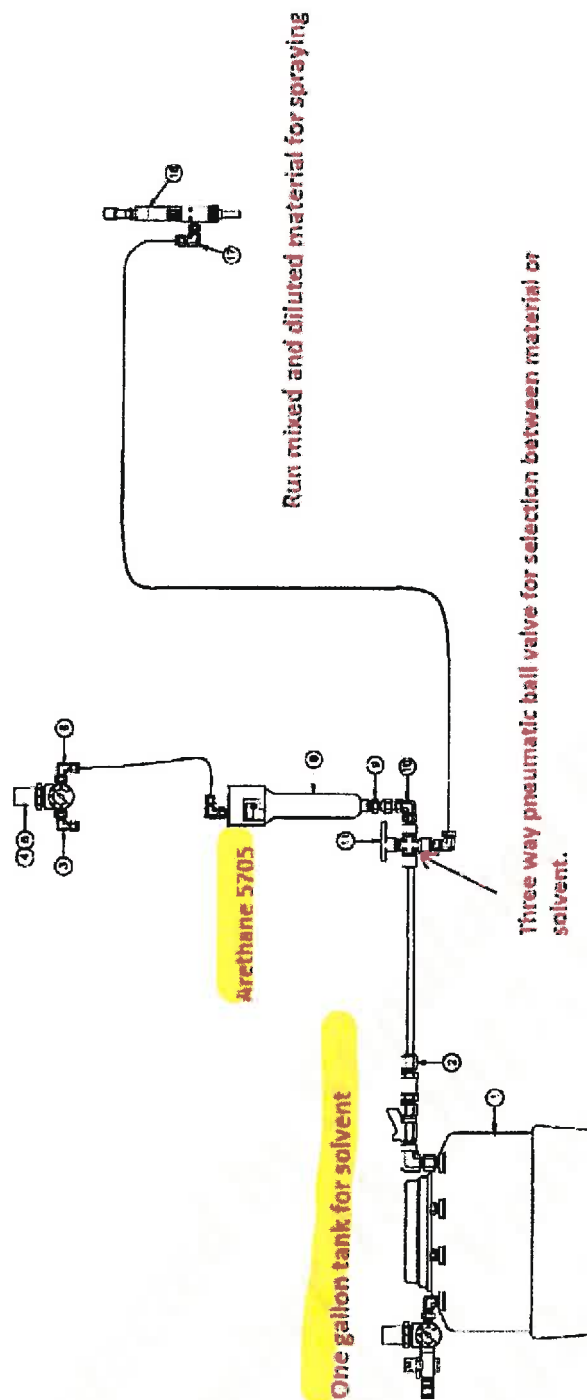
EXHIBIT 27





PVA\SPCX2115\Space X add auto flush system\

PVA-0345





PVA\SPCX2115\Space X add auto flush
system\

412PVA-0347

line	Description	Part Number	Qty	Cost	Ext cost	Price	Ext price
1				\$	-	\$	-
2				\$	-	\$	-
3				\$	-	\$	-
4	ASSEMBLY,ACTUATED,AIR,3-WAY,BALL,VAL	ss-43GXf4-51D	1	\$ 360.66	\$ 360.66	\$ 1,081.98	\$ 1,081.98
5	Pressure Tank, 1-Gallon Stainless Steel Reservoir Assy.	PVA/G	1	\$ 469.53	\$ 825.00	\$ 825.00	\$ 825.00
6	Hoses and fittings - misc	Hoses and fittings	1	\$ 450.00	\$ 450.00	\$ 1,350.00	\$ 1,350.00
7	VALVE,SLEND,3 POS,CENTER CLOSED.	VQ1301-51	1	\$ 52.20	\$ 52.20	\$ 156.60	\$ 156.60
8	Programming and engineering	P+E	8	\$ 95.00	\$ 760.00	\$ 95.00	\$ 760.00
9				\$	-	\$	-
10				\$	-	\$	-
11				\$	-	\$	-
12				\$	-	\$	-
13				\$	-	\$	-
14				\$	-	\$	-
15				\$	-	\$	-
16				\$	-	\$	-
17				\$	-	\$	-
18				\$	-	\$	-
19				\$	-	\$	-
20				\$	-	\$	-
21				\$	-	\$	-
22				\$	-	\$	-
23				\$	-	\$	-
24				\$	-	\$	-
25				\$	-	\$	-
26				\$	-	\$	-
27				\$	-	\$	-
28				\$	-	\$	-
29				\$	-	\$	-
30				\$	-	\$	-
				\$	-	\$	-
				\$	-	\$	-
				\$	-	\$	-
				\$	-	\$	-
Totals				\$ 1,427.39	\$ 2,447.86	\$ 3,508.58	\$ 4,173.58

From: David Gomez
Sent: Tuesday, September 10, 2013 11:04 AM
To: Jonathan Connelly; Richard Bievenue
Cc: David Filbert; Michael R. Leonard; Jonathan Urquhart
Subject: RE: meter-mix application

Hey mang,

No need for Dave and his metering mix systems.

Looks like they only want a 20oz cartridge retainer&cap with spray & needle valve for the pre-mix material and a 6oz cartridge retainer&cap for the solvent ,so it can flush the premixed material out right after doing a batch of boards.

I've done this fluid delivery line several times.

Let me know if you need a project # for reference,Urquhart can also tell you how this is done

Regarding options for spraying two part coatings –we are not there yet.

David E Gomez
PVA
Account Executive
281 217 7247

From: Jonathan Connelly
Sent: Tuesday, September 10, 2013 10:10 AM
To: Richard Bievenue
Cc: David Filbert; David Gomez; Michael R. Leonard
Subject: RE: meter-mix application

It is going to be a long time before I could do any real work on a full MMX system for them... unless Dave f wants to work on that part.

I could set them up with a quote for a syringe system for premixed material...

From: Richard Bievenue
Sent: Monday, September 09, 2013 2:12 PM
To: Jonathan Connelly
Cc: David Filbert; David Gomez; Michael R. Leonard
Subject: meter-mix application

Jon,

I just spoke with an engineer from SpaceX named Duc Phan (pronounced "Dook Fawn"). They have one of our 350 machines, s/n W3267. They want to switch to a 2-part material, Huntsman Arathane 5750. They are currently considering just pre-mixing the material and then flushing it out after a couple hours, using a series of valves and solvent tanks. Mike Leonard may be assisting them with getting the electrical schematics and discussing program options with them in case they try to do this on their own.

They would also like to hear what options we have for them as far as a 2-component meter-mix system. Can you contact Duc and let him know you would be the man to pick up the ball on this? Then we can discuss what the best configuration would be.

Contact info:

Duc.phan@spacex.com
Ph: 310-363-6316

Best Regards,

Rich Bievenue
Fluid Systems Engineer



1 Mustang Drive
Cohoes, NY 12047
Ph: 518-371-2684 x2203
rbievenue@pva.net

From: David Gomez
Sent: Wednesday, September 18, 2013 12:41 PM
To: Jonathan Connelly; Richard Bievenue; David Filbert
Subject: RE: Arethane 5750 Automate Rinse and Pruge PVA 350, P/N: SPCX2115 S/N: W3267

Guys,

FYI – this is not the first time we have done this (fluid delivery for a two part coating), I really think we are putting too much resources in this.

REF - project SEAK3101

David E Gomez
PVA
Account Executive
281 217 7247

From: Jonathan Connelly
Sent: Wednesday, September 18, 2013 2:17 PM
To: Richard Bievenue; David Filbert
Cc: David Gomez
Subject: RE: Arethane 5750 Automate Rinse and Pruge PVA 350, P/N: SPCX2115 S/N: W3267

Ok let me send my sketch over to Duc and see if he is ok with running two different dilutions out of two different cartridges with a third tank or cartridge for solvent flush..

From: Richard Bievenue
Sent: Wednesday, September 18, 2013 2:50 PM
To: Jonathan Connelly; David Filbert
Cc: David Gomez
Subject: RE: Arethane 5750 Automate Rinse and Pruge PVA 350, P/N: SPCX2115 S/N: W3267

I think conceptually that will work, but I would want to minimize the overall number of fittings, eliminate elbows where possible, and optimize the hose/tubing size to keep the volume of mixed material to a minimum and maximize the effectiveness of the solvent flush.

From: Jonathan Connelly
Sent: Wednesday, September 18, 2013 1:43 PM
To: Richard Bievenue; David Filbert
Cc: David Gomez
Subject: RE: Arethane 5750 Automate Rinse and Pruge PVA 350, P/N: SPCX2115 S/N: W3267

Rich,

This is what I want to offer Mr. Duc based on this e-mail. See my sketch attached. He should be able to run the diluted mixture with one cartridge and the undiluted mixture with the other then have a tank full of solvent to flush the whole thing out when he wants to..

Let me know what you think..

Thanks,

From: Duc Phan [mailto:Duc.Phan@spacex.com]

Sent: Friday, September 13, 2013 11:20 AM

To: Jonathan Connelly; Michael R. Leonard

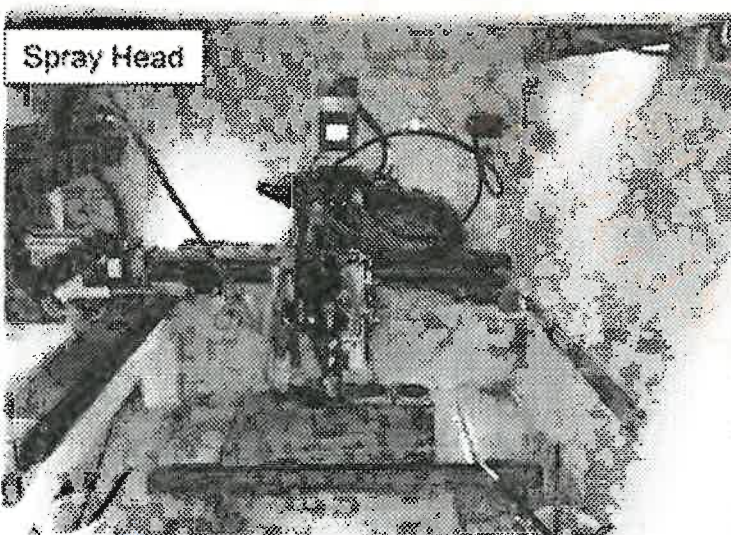
Cc: Richard Bievenue; David Filbert

Subject: RE: Arethane 5750 Automate Rinse and Pruge PVA 350, P/N: SPCX2115 S/N: W3267

Hello Jon,

The current process we removed the hoses from the spray dispensing head and connect the hoses from the Arethane material and Solvent to it. When the Arethane material not in use we caped the Solvent hose and connect the Arethane material hose to the other head just for place holder. The Arethane 5750, part A and part B is mixed together and poured in the first reservoir and the second reservoir is the solvent use to thin out the mixed Arethane for spray requirement.

If you have three parts metering spray valve please provide a quote also.



Thanks,

Duc Q. Phan

SpaceX

Process Engineer

1 Rocket Road

Hawthorne, CA 90250

D PH: 31-363-6316

C PH: 310-940-9320

From: Jonathan Connelly [<mailto:JConnelly@PVA.net>]
Sent: Friday, September 13, 2013 6:07 AM
To: Duc Phan; Michael R. Leonard
Cc: Richard Bievenue; David Filbert
Subject: RE: Arethane 5750 Automate Rinse and Pruge PVA 350, P/N: SPCX2115 S/N: W3267

Hi Duc,

I have this almost complete. Looking at your pictures. It looks like our drawings do not match what you run on that machine.

Are you running both the Arethane and the solvent out of the cartridges mounted on the side of the machine?

Could you send me a picture from the back of the machine where the material connections connect and flow inside the work area?

Thanks,

-Jon

From: Duc Phan [<mailto:Duc.Phan@spacex.com>]
Sent: Thursday, September 12, 2013 11:09 AM
To: Jonathan Connelly; Michael R. Leonard
Cc: Richard Bievenue; David Filbert
Subject: RE: Arethane 5750 Automate Rinse and Pruge PVA 350, P/N: SPCX2115 S/N: W3267

Hello Jon,
I am following up on the quote for the air actuator valves and the new program to implement rinse and purge changes. We are very exciting to get this Arethane 5750 material automate.

Thank you,

Duc Q. Phan
SpaceX
Process Engineer
1 Rocket Road
Hawthorne, CA 90250
D PH: 31-363-6316
C PH: 310-940-9320

From: Jonathan Connelly [<mailto:JConnelly@PVA.net>]
Sent: Tuesday, September 10, 2013 8:55 AM
To: Duc Phan; Michael R. Leonard
Cc: Richard Bievenue; David Filbert
Subject: RE: Arethane 5750 Automate Rinse and Pruge PVA 350, P/N: SPCX2115 S/N: W3267

Hi Duc,

I am copying some other people here that you may have talked to or not.

Looking at your request.. We could put pneumatic ball valves to control the material and flush. I think it will waste a good amount of material and solvent. You will need to flush out the material with each rinse cycle and then purge out the solvent until the material starts flowing again...

We could add timers to the machine to stop and alarm every 30 minutes or hour to remind the operators to flush and fill the system..

Do you already have 24 VDC actuator valves that you are planning to use? Why do you need analog control for these? Do you have a data sheet on them?

Best regards,

Jon Connelly
Technical Sales
PVA
1 Mustang Drive
Cohoes NY, 12047
Ph# (518) 371-2684 ext 2421
Cell (518) 487-9611
Fax (518) 371-2688

From: Duc Phan [<mailto:Duc.Phan@spacex.com>]
Sent: Tuesday, September 10, 2013 11:35 AM
To: Michael R. Leonard; Jonathan Connelly
Subject: Arethane 5750 Automate Rinse and Pruge PVA 350, P/N: SPCX2115 S/N: W3267

Hello John,

I am a Process engineer for SpaceX located in Hawthorne, CA. We have the PVA 350, P/N: SPCX2115 S/N: W3267. We are using the Arethane 5750 material that have 2 hours cure time, which we are concern that operator may forgot to purge and rinse the material when the job is done. To avoid this problem I am hoping to automate the purge and rinse process. The plan is to have the 24VDC actuator valves to turn on/off the purge and rinse reservoirs after the coating program.

I need help writing the subroutine program for rinse and purge and identify which analog signals can I connect the 24VDC actuator valves and the which digital signals to turn them on?

Thank you in-advance for helping!

Duc Q. Phan
SpaceX
Process Engineer
1 Rocket Road
Hawthorne, CA 90250
D PH: 31-363-6316
C PH: 310-940-9320

From: Michael R. Leonard [<mailto:MLeonard@PVA.net>]
Sent: Monday, September 09, 2013 10:53 AM
To: Duc Phan
Subject: schematic

Duc,

Here is the electrical schematic for your machine. Also here is Jon Connelly's information. jconnelly@pva.net and his number is (518)371-2684 ext 2421.

Thanks,
Mike

From: Ted St. Marie
Sent: Monday, October 14, 2013 1:34 PM
To: Mark Kniese; Rex Ellis; Rodrigo Gutierrez
Cc: Kyle Crane; Jonathan Connelly; Mark Kniese; Jamie Blender
Subject: RE: SPCX2115 W3267R2
Attachments: W3267R2.xls

Mark,

Here's what I have for this pneumatic, adding the pneumatic ball valve for the auto solvent flush to the 7th manifold station with a 2-position solenoid.

All other dispense, pneumatic schematics & documentation are completed in the project rework folders.

Thanks,

Ted

From: Ted St. Marie
Sent: Monday, October 14, 2013 1:08 PM
To: Kyle Crane; Jeffrey Van Norden
Cc: Jonathan Connelly; Mark Kniese; Jamie Blender
Subject: RE: SPCX2115 W3267R2

Kyle,

I just got this back and I'm finishing up on it now, I'll let you know when I'm done.

Thanks,

Ted

From: Kyle Crane
Sent: Monday, October 14, 2013 10:57 AM
To: Jeffrey Van Norden
Cc: Jonathan Connelly; Mark Kniese; Jamie Blender; Ted St. Marie
Subject: RE: SPCX2115 W3267R2

Jeff,

Is the pneumatic BOM going to be updated for the pneumatic ball valve or is that not going to be controlled by the manifold?

Best Regards,
Kyle Crane



Production-Reworks



: (518) 371-2684 Ext: 2433



: KCrane@pva.net

From: Ted St. Marie

Sent: Monday, October 14, 2013 10:50 AM

To: Kyle Crane

Cc: Jeffrey Van Norden; Jonathan Connelly; Mark Kniese; Jamie Blender

Subject: RE: SPCX2115 W3267R2

I no longer have that paperwork, I'm guessing that project was reassigned when I was out last week?

Thanks,

Ted

From: Kyle Crane

Sent: Monday, October 14, 2013 10:46 AM

To: Ted St. Marie

Subject: SPCX2115 W3267R2

Is SPCX fully updated?

Best Regards,

Kyle Crane



Production-Reworks



: (518) 371-2684 Ext: 2433



: KCrane@pva.net

A	B	C	D	E	F	G	H	I	J	K	L
1											
2	B32-0149R2										
3	MACHINE 2300										
4	8 STATION										
5	Station										
6	1										
7	2										
8	3										
9	4										
10	5										
11	6										
12	7										
13	8										
14											
15											
16	Rules for Sensor										
17	Input #										
18											
19	Low Level (mat.)										
20	PIP (Conveyor)										
21	Pneumatic										
22	PIP (Fixture)										
23	SPARE										
24	Needle Cal.										
25	Needle Cal. in place										
26	Low Exhaust Flow										

EXHIBIT 27

From: Ted St. Marie
Sent: Wednesday, October 16, 2013 10:53 AM
To: Jonathan Connelly; Rex Ellis; Michael R. Leonard; Kyle Crane
Cc: Mark Kniese; Wendy Wen
Subject: RE: SPCX2115 W3267R2 rework

Wendy has updated the electrical for the pneumatic ball valve to be controlled by a 3-position solenoid for the auto solvent flush.

Thanks,

Ted

From: Wendy Wen
Sent: Wednesday, October 16, 2013 10:47 AM
To: Ted St. Marie
Subject: SPCX2115

Hi Ted,

I have updated the electrical Schematic 123-2435R2, and the Bom 872-01433. It is all set on electrical end.

Thanks,
Wendy

From: Jonathan Connelly
Sent: Wednesday, October 23, 2013 9:20 AM
To: Rex Ellis
Subject: FW: Release of Purchase Order 258364 Space X

From: Duc Phan [mailto:Duc.Phan@spacex.com]
Sent: Wednesday, October 23, 2013 12:07 PM
To: Jonathan Connelly
Cc: Rodrigo Gutierrez; David Filbert; Michael R. Leonard
Subject: RE: Release of Purchase Order 258364

Hello John and Michael,

Thank you for your great service of installing the automatic flush system. Few bugs to work out.

1. In automatic mode the spray valve is not dropping down.
2. In rinse location we need to drop the valve down to make it the same as auto rinse and flush.

Thank you,

Duc Q. Phan
SpaceX
Process Engineer
1 Rocket Road
Hawthorne, CA 90250
D PH: 31-363-6316
C PH: 310-940-9320

From: Jonathan Connelly [mailto:JConnelly@PVA.net]
Sent: Thursday, October 17, 2013 12:13 PM
To: Duc Phan
Cc: Rodrigo Gutierrez; David Filbert; Michael R. Leonard
Subject: RE: Release of Purchase Order 258364

Hi Duc,

The parts are leaving today via Fed Ex standard overnight tracking number 558400575653 can you please confirm to me when you receive them tomorrow?

Mike Leonard has arrangements made to fly out Monday and be at your facility Tuesday the 22nd.

Anything else please feel free to ask.

Best regards,

Jon Connelly
Technical Sales
PVA
1 Mustang Drive

Cohoes NY, 12047
Ph# (518) 371-2684 ext 2421
Cell (518) 487-9611
Fax (518) 371-2688

From: Duc Phan [<mailto:Duc.Phan@spacex.com>]
Sent: Wednesday, October 16, 2013 5:34 PM
To: Jonathan Connelly
Cc: Rodrigo Gutierrez; David Filbert
Subject: RE: Release of Purchase Order 258364

Hello Jonathan and Rodrigo,
Please let me know your arrive schedule for next week Oct. 21st.
Also what do I need to do to prepare for your onsite work?

Thanks,

Duc Q. Phan
SpaceX
Process Engineer
1 Rocket Road
Hawthorne, CA 90250
D PH: 31-363-6316
C PH: 310-940-9320

From: Jonathan Connelly [<mailto:JConnelly@PVA.net>]
Sent: Tuesday, October 08, 2013 8:05 AM
To: Duc Phan
Cc: Rodrigo Gutierrez; David Filbert
Subject: RE: Release of Purchase Order 258364

Thanks Duc,

Attached is a picture of the new dispense system we are planning to build you.

Let me know if this looks ok to you and I will work on getting these out to your asap.

We have you penciled in for service the week of the 21st for the service trip. Let us know which day is best for you that week.

Best regards,

Jon Connelly
Technical Sales
PVA
1 Mustang Drive
Cohoes NY, 12047
Ph# (518) 371-2684 ext 2421
Cell (518) 487-9611
Fax (518) 371-2688

From: Duc Phan [<mailto:Duc.Phan@spacex.com>]
Sent: Tuesday, October 08, 2013 10:55 AM
To: Jonathan Connelly
Subject: RE: Release of Purchase Order 258364

Please see below.

FedEx Accounts for Hawthorne:
Small parcel and air freight account #: 251204527
Main freight account #: 414707149

Thanks,

Duc Q. Phan
SpaceX
Process Engineer
1 Rocket Road
Hawthorne, CA 90250
D PH: 31-363-6316
C PH: 310-940-9320

From: Jonathan Connelly [<mailto:JConnelly@PVA.net>]
Sent: Monday, October 07, 2013 8:15 AM
To: Duc Phan
Subject: RE: Release of Purchase Order 258364

Hi Duc,

Give me a call today when you get a chance? The status of your current order is dependent on what you want to with the 2nd material.

Thanks,

-Jon

From: Duc Phan [<mailto:Duc.Phan@spacex.com>]
Sent: Wednesday, October 02, 2013 11:42 AM
To: Jonathan Connelly
Subject: RE: Release of Purchase Order 258364

Hello Jonathan,

I am waiting to talk with my manager but as for the original plan must stay on schedule for October 21 because I am reserve the from production that day.

I will call you this afternoon for sure.

Thanks

Duc Q. Phan
SpaceX
Process Engineer
1 Rocket Road
Hawthorne, CA 90250
D PH: 31-363-6316
C PH: 310-940-9320

From: Jonathan Connelly [<mailto:JConnelly@PVA.net>]
Sent: Wednesday, October 02, 2013 8:39 AM
To: Duc Phan
Subject: RE: Release of Purchase Order 258364

Hi Duc,

I'm not sure where we left off with this.

Can you give me a call later this afternoon to discuss?

Thanks and best regards,

Jon Connelly
Technical Sales
PVA
1 Mustang Drive
Cohoes NY, 12047
Ph# (518) 371-2684 ext 2421
Cell (518) 487-9611
Fax (518) 371-2688

From: Duc Phan [<mailto:Duc.Phan@spacex.com>]
Sent: Thursday, September 26, 2013 3:02 PM
To: Jonathan Connelly; warpdrive
Cc: Rodrigo Gutierrez
Subject: RE: Release of Purchase Order 258364

Hello Jonathan and Rod,
We are interest in having second pneumatic valve adding to the existing changes.
Please give me a call to go over the program and control.
Thanks,

Duc Q. Phan
SpaceX
Process Engineer
1 Rocket Road
Hawthorne, CA 90250
D PH: 31-363-6316
C PH: 310-940-9320

From: Jonathan Connelly [<mailto:JConnelly@PVA.net>]
Sent: Wednesday, September 25, 2013 8:50 AM
To: Duc Phan; warpdrive
Cc: Rodrigo Gutierrez
Subject: RE: Release of Purchase Order 258364

Hi Duc,

Rod has you penciled in for a day of support on the week of the 21st.

You can work with Rod to get a specific day confirmed.

Best regards,

Jon Connelly
Technical Sales
PVA
1 Mustang Drive
Cohoes NY, 12047
Ph# (518) 371-2684 ext 2421
Cell (518) 487-9611
Fax (518) 371-2688

From: Duc Phan [<mailto:Duc.Phan@spacex.com>]
Sent: Wednesday, September 25, 2013 11:26 AM
To: Jonathan Connelly; warpdrive
Subject: RE: Release of Purchase Order 258364

Hello Jonathan,
Per our conversation the sooner the better.
On reserve Oct. 21-25 any one of these date will be fine.

Thanks,

Duc Q. Phan
SpaceX
Process Engineer
1 Rocket Road
Hawthorne, CA 90250
D PH: 31-363-6316
C PH: 310-940-9320

From: Jonathan Connelly [<mailto:JConnelly@PVA.net>]
Sent: Wednesday, September 25, 2013 5:12 AM
To: warpdrive
Cc: Duc Phan
Subject: RE: Release of Purchase Order 258364

Thanks Guys,

We will get started on this.

Duc,

Do you have a date that would be good for the on-site support to integrate this?

Best regards,

Jon Connelly
Technical Sales
PVA
1 Mustang Drive
Cohoes NY, 12047
Ph# (518) 371-2684 ext 2421
Cell (518) 487-9611
Fax (518) 371-2688

From: Warp Drive [<mailto:warpdrive@spacex.com>]
Sent: Tuesday, September 24, 2013 7:57 PM
To: Jonathan Connelly
Cc: Duc.Phan@spacex.com
Subject: Release of Purchase Order 258364

Attached please find approved purchase order 258364. Please acknowledge receipt of Purchase Order by sending an email to Andrea Jarrett at Andrea.Jarrett@spacex.com. This message was automatically generated; Please contact the Buyer if the order requires any further clarification at the address mentioned above.